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LOS ALAMOS NATIONAL LABORATORY

NATIONAL SECURITY RESEARCH CENTER **2021**
STRATEGIC PLAN



LETTER FROM THE NSRC DIRECTOR

RIZWAN ALI

In the years since Los Alamos National Laboratory was founded, adversarial threats to our national security have grown and become increasingly complex. The United States must maintain our interests and way of life in a challenging global landscape.

Strengthening America's national security is our Laboratory's mission. It's one we've fulfilled since our inception in 1943, when we were tasked with designing and building the world's first nuclear weapons to help end World War II. The need for a nuclear deterrent remains critical today. For this reason, the Laboratory began work in 2018 to establish the National Security Research Center (NSRC), which formally opened its doors in June 2019.

The NSRC is the Lab's classified library. It houses the world's most comprehensive collection of nuclear weapons and national security materials dating to the Manhattan Project.

After nearly two years of concentrated effort from more than 40 staff members, what was once a repository of archival materials is now a dynamic, vibrant collection of digital and physical resources that our scientists, engineers, and researchers access as they solve national security challenges. The NSRC's collections are curated by a highly trained team that offers personalized research assistance.

Simply put, the NSRC's holdings are national assets that are vital to the Laboratory, the National Nuclear Security Administration, our partner labs and sites, and the Department of Defense. As the NSRC's Director, I am invested in the success of the Center because Los Alamos National Laboratory's mission – and thus the security of our country – depends on it.

The following pages outline high-priority objectives for the NSRC over the next five years. I am confident the Center will continue to contribute to Los Alamos National Laboratory's long history of technical excellence and service to our nation.



Rizwan Ali
Director, National Security Research Center
Los Alamos National Laboratory





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STRATEGIC PLAN

EXECUTIVE SUMMARY

The National Security Research Center (NSRC) is a dynamic organization staffed with an expert, highly trained experts. The NSRC opened its doors in June 2019, making it one of the newest large organizations at Los Alamos National Laboratory (LANL). It supports a broad range of researchers within the LANL Weapons Program, customers across other National Nuclear Security Administration (NNSA) labs and sites, and partners in the Department of Defense (DoD).

The maintenance and growth of the NSRC necessitate strategy and foresight. The NSRC leadership has developed a series of strategic goals through discussions with NSRC staff, customers, LANL leadership, and similar research institutions around the country to guide the NSRC leadership in moving the Center forward over the next five years.

STRATEGIC GOAL 1: A DOCUMENT COLLECTION AND CUSTOMER BASE THAT ENCOMPASS BOTH THE ENTIRE LABORATORY AND SELECTED EXTERNAL ORGANIZATIONS.

The NSRC should work to develop and enhance partnerships to expand its collections and broaden its customer base. The current customers of the NSRC are primarily within the LANL Weapons Program, specifically Weapons Physics. However, the NSRC's collections are broad and can benefit others in the Weapons Program. For example, engineering drawings and pit production information held by the NSRC are useful to the Lab's Weapons Engineering and Weapons Production, respectively. Other LANL organizations, such as Global Security, would most certainly benefit from the NSRC's collections. Global Security is currently a user of the Online Vault (OLV), but they may not be as aware of the Center's physical collections. There will likely be significant benefits to the Weapons Program and other LANL organizations for them to share a larger portion of their collections with the NSRC. Beyond the internal LANL organizations, the NSRC should work to develop and enhance partnerships with other NNSA labs and sites, as well as DoD organizations.

Some partnerships already exist, such as with Lawrence Livermore National Laboratory, but can be strengthened. Other partnerships, such as with the Defense Threat Reduction Agency and the Air Force Technical Application Center, should be developed. Each of these organizations can benefit from having access to the NSRC's collections, and the NSRC's internal customers can benefit from having access to information contained in these external organizations' collections.

STRATEGIC GOAL 2: A COMPREHENSIVE SET OF DIGITIZED COLLECTIONS THAT ARE CATALOGED AND SEARCHABLE USING ARTIFICIAL INTELLIGENCE/ MACHINE-LEARNING TOOLS.

The NSRC estimates that less than 10 percent of its physical collections have been digitized and that less than 10 percent of those digitized collections have been cataloged. This digitized, though uncatalogued, portion amounts to millions of documents that could potentially save the Lab tens of millions of dollars per year and countless hours in redundant research or experiments. However, manually cataloging this material would take hundreds of years. The only way to economically catalog the NSRC's digitized collections is to use automated machine learning to make materials available to researchers digitally. This would eliminate the need for NSRC staff to catalog each document manually, a 10 to 30 minute process. Expert staff would train the machine-learning algorithm for each document type and then perform spot checks to ensure the machine-learning system is accurately parsing the needed information.

Additionally, the NSRC should have the ability to search through all its digitized collections. The digitized collections are housed in various data repositories, such as the Documentum-based Online Vault, PDMLink/Windchill, SharePoint, and shared drives. A natural-language, machine-learning search system would provide the ability to search through all these disparate systems while maintaining security and need-to-know protocols.



“The Lab’s mission is to ensure our national security. Achieving that mission starts with the National Security Research Center.”

Rizwan Ali, Director, NSRC

Once the automated cataloging and search capabilities are effectively implemented, the NSRC should explore the possibility of extending these capabilities across other NNSA labs and sites. Information safeguards can be built into the systems to address security, intellectual property, and need-to-know concerns at each of the labs and sites.

STRATEGIC GOAL 3: ACCELERATED DIGITIZATION LABS WITH NEW PROCESSES THAT ARE ESTABLISHED AND OPERATIONAL.

The NSRC’s physical collections contain a large number of media types, including paper notes, engineering drawings, microfilm, microfiche, photos, aperture cards, videos, and motion-picture film. Each of these media types has its own characteristics and challenges when it comes to digitization.

The NSRC estimates that less than 10 percent of its millions of holdings have been digitized. Until recently, the NSRC attempted to digitize all its various media in parallel. This approach did not yield significant progress, and the NSRC staff have determined the backlog in digitizing cannot be addressed with the current set of prioritization, equipment, and processes.

The NSRC staff conducted a detailed analysis of how long it would take for the physical holdings to be digitized with existing prioritization, equipment, and processes. The results were eye opening. It would have taken 8 years to digitize the Center’s video collection, 93 years to digitize its microfiche collection, 760 years to digitize the paper reports, and about 2,000 years to digitize the microfilm collection. These digitization rates were obviously unacceptable to the Lab and the NNSA.

The NSRC embarked on a detailed search of industry best practices and visited a number of organizations that were conducting large-scale document digitizing operations, to include the National Archives and Records Administration (NARA), the DoD’s National Reconnaissance Office, the Department of Energy’s Waste Isolation Pilot Plant, Iron Mountain Inc., and Crowley Company. This analysis revealed that it is possible to complete the NSRC’s digitizing projects in reasonable amounts of time, but a complete revamp is required in prioritization, equipment selection, software, processes, facilities, and training. There is no single item on this list that will dramatically increase digitizing rates. The items identified in the list work synergistically to dramatically increase the digitization rates. Work in each of those areas has started, but significant lead time is needed to address all these items.

As mentioned above, digitizing the physical holdings requires much more than just the right equipment. New processes must be developed to handle the greater speed and volume, new personnel training must be established, and additional facility spaces are required to establish dedicated high-speed, high-volume digitization labs. Additionally, the materials should be digitized and stored in accordance with NARA standards.

STRATEGIC GOAL 4: AN EXPERT STAFF WITH SPECIALIZED SKILLS ENHANCED THROUGH CONTINUED PROFESSIONAL EDUCATION AND CERTIFICATION PROGRAMS.

Staff development is critical to the success of the NSRC. Not only is the professional development of the staff important to the internal operations of the Center, it is also important in projecting a high degree of staff competence to customers and partner organizations.

The enhancement of the skills of the NSRC’s staff can be achieved through a variety of methods to include professional training classes, attendance at industry conferences, and internal training opportunities that are focused on their areas of expertise.

Professional continuing education of the staff should be patterned on similar programs at major libraries and archives that require their staff to continue to improve their knowledge of their areas of expertise through a self-directed education program. Other organizations require their staff to obtain a certain number of professional continuing education credits.

Because the NSRC uses highly specialized equipment and specialized processes, an equipment certification program should be developed for each machine to ensure staff have been properly trained and are aware of the digitization standards being employed in the NSRC for each media type.

The Center’s staff should also strive to increase their overall general knowledge of nuclear weapons science and history. This general knowledge will help the staff gain a better appreciation of the value of the NSRC’s collections as well as better meet customer needs.

STRATEGIC GOAL 5: A SECURE SET OF FUNDING SOURCES FOR ENDURING AND ENHANCED OPERATIONS AND GROWTH.

The NSRC is an enduring organization and requires long-term sources of funding in order for it to offer a robust set of services to customers. The enduring funding sources could be used to ensure a proper level of staffing, appropriate maintenance contracts, and a regularly scheduled refresh of the professional digitizing equipment.

Additionally, the automated cataloging and search systems needed by the NSRC require annual licensing and technical refresh funding. Lastly, one or more permanent facilities should be secured to provide storage that meets NARA standards and adequate space to establish digitization facilities.

Each of these funding areas works synergistically to ensure the NSRC is delivering the type of services at the speed required by customers and partners. ☺



The NSRC houses the world’s most-comprehensive collections of nuclear weapons and national security materials, dating back to the Manhattan Project. The millions of materials are in a variety of media.

A BRIEF HISTORY OF THE NATIONAL SECURITY RESEARCH CENTER

“By the later 1940s, the Laboratory was emerging as a permanent institution vital to national security.”



The story of the National Security Research Center (NSRC) began in 1943. In the opening months of that year, as the Battle of Stalingrad came to a close, the Laboratory was hastily built. Los Alamos was tasked with designing, building, testing, and helping deliver in combat the world's first nuclear weapons. One of the earliest initiatives at Project Y (the Laboratory's wartime code name) was to establish a technical library within the main technical area because, as an official history of the wartime Laboratory states, “No research laboratory can exist without a library well-stocked with standard technical reference works, files of technical journals, and reports of work in progress, especially when it is isolated from all other universities and libraries.” This idea, and the wartime collection it produced, is where the history of the NSRC starts.

Led by Charlotte Serber, the library staff collected books, articles, and reports pertaining to nuclear physics, engineering, metallurgy, chemistry, and other critical scientific fields. In fact, by the summer of 1945 the library had managed to collect about 3,000 books and hundreds of technical articles. The librarians also issued official Laboratory notebooks to researchers for recording technical progress. The experimental data collected in the notebooks were interpreted in formal reports, which were formally accessioned into the library by Serber's staff. Preparing, duplicating, and distributing the reports were handled by two sections, the Workshop and Document Room, within Serber's group. When 1945 began, the library had collected over 6,000 technical reports; many came from other Manhattan Project sites, but a vast majority were produced by Laboratory scientists.

After World War II, a significant portion of the staff left Los Alamos. Laboratory Director J. Robert Oppenheimer, who resigned weeks after the official surrender of Japan, took time to pen a personal letter of gratitude to Serber: “Perhaps the best way of saying how well you have discharged the responsibilities involved is this: I have never had a complaint of how the Library or Document Room were run, and in this large and often chaotic laboratory I have found there was no reluctance on the part of the staff to enter such complaint at the slightest provocation.” With the Laboratory's mission complete, many believed the Laboratory would close, but as the Cold War intensified, the future of Los Alamos solidified.



| *Physicist J. Robert Oppenheimer served as the Lab's first Director from 1943 to 1945.*

“Perhaps the best way of saying how well you have discharged the responsibilities involved is this: I have never had a complaint of how the Library or Document Room were run, and in this large and often chaotic laboratory I have found there was no reluctance on the part of the staff to enter such complaint at the slightest provocation.”

from a letter to library staff written in 1945 by then-Director J. Robert Oppenheimer

By the later 1940s, the Laboratory was emerging as a permanent institution vital to national security. With each passing year, more important records were produced — not just reports, such as the ones housed in the Technical Library, but project records, memos, payroll records, and personnel files. To house all of these records, a bay in a warehouse in downtown Los Alamos was acquired. Originally, the bay provided storage space for the guard force's equipment, but ultimately, the Records Management Group would take over the entire building and gradually fill it with millions of technically valuable and historically priceless documents. The War Department's decimal system, which was introduced to the Records Center by Sgt. Pat McAndrew, was used to successfully manage collections, including the Director's correspondence, for decades.

At roughly the same time the warehouse bay was acquired for Laboratory records, the Weapons Program hired Beverly Wellnitz as a secretary. Though Wellnitz had no formal technical training, she recognized the importance of the records generated by the Weapons Program. To ensure data remained accessible, she created “shot folders,” which were folders of information pertaining to early nuclear tests. As the Laboratory performed more and more tests, Wellnitz's collection of shot folders grew substantially through the years; they are still consulted today.

Over the decades, the holdings of the Technical Library, Wellnitz's collection, and the Records Center all grew independently. The Technical Reports Collection remained a part of the Laboratory's Research Library, which was led by Group Leader J. Arthur Freed for decades. As the Technical Library grew in its new location, the basement of the J. Robert Oppenheimer Study Center, librarians including Jackson Carter and later Marie Harper, played key roles in the maintenance of the Laboratory's original collection of technical information. Meanwhile, Wellnitz worked at the Laboratory until 1987. For 40 years, she grew her collection, then housed it at the Laboratory's Administration Building and made it more accessible to weapons design physicists.

Given the immense historical value of many documents in the Records Center, the Laboratory hired Alison Kerr and Nancy Zachariason to start an archive in the early 1980s. Kerr and Zachariason were tasked with locating, collecting, and preserving records of permanent value to the Laboratory. Kerr and consultant Lillian Hoddeson proposed an official technical history of the wartime work of Los Alamos, which became “Critical Assembly.” When Zachariason and Kerr left the Laboratory, long-time Lab Historian Roger Meade successfully managed the technical history project to completion and oversaw the expansion of the Laboratory Archives for nearly a quarter century — an endeavor that Meade, who retired in 2007, describes as challenging yet rewarding. “I'm proud to have been a part of the efforts to preserve Los Alamos's incredible history. The Lab's legacy continues today, which would not have been possible without the careful curation and preservation of the records from our original weapons mission.”



Beverly Wellnitz

About the same time the first collections of the Laboratory Archives were processed, the Weapons Program began consolidating existing electronic finding aids and databases. Carolyn Mills was given the task, and over the next decade, she and her team amassed a tremendous amount of content into a database known as COEDS, which stands for COmmon Event Database System.



It was an important achievement, as scientists would no longer have the opportunity to create new test data: The most recent full-scale U.S. nuclear test was conducted in 1992. Soon thereafter, the Nuclear Weapons Archiving Project (NWAP), which began informally at the grassroots level, was formed to identify and maintain records of vital interest to the Weapons Program. NWAP included technical staff members, as well as records

custodians such as Mills and Carter. Another early member of the team was Helen Newton, who was Beverly Wellnitz's successor. Newton hoped to develop an electronic system that would include scanned and text-searchable. This idea, which Mills and her COEDS team helped bring to fruition, has evolved into today's Online Vault.

By 2000, the Records Center warehouse was over 50 years old and rapidly falling into disrepair. Thus, most of the first floor of the proposed National Security Sciences Building (NSSB) was set aside for records storage. When the NSSB opened in 2006 to serve as the Laboratory's headquarters building, the contents of the Records Center and Laboratory Archives were moved into the new National Archives and Records Administration certified vault. Months later, the Historical Image Archive and the Technical Reports Collection, formerly a part of the Laboratory's Research Library, were moved into the facility as well. The vault also had room for the Wellnitz Collection, which was then managed by the X*Archive Team (formerly COEDS). Meanwhile, a second version of the Online Vault was being developed.

For nearly a decade and a half, the Records Management Group operated the physical vault with the X*Archive Team as a tenant. During those years, the Technical Reports Collection, Wellnitz Collection, and Laboratory Archives grew significantly, driven by waves of retirements and the demolition of older LANL facilities with vaults. In early 2019, these collections were

brought together organizationally by Michael Bernardin, who was at that time the Lab's Associate Director for Weapons Physics. The Technical Reports Collection and Archives, formerly part of LANL's Records Management Group, joined the Wellnitz Collection and the electronic libraries of the Weapons Program to form the National Security Research Center.

As the records were consolidated organizationally by the Weapons Research Services Division in the spring of 2019, the vault was significantly upgraded to reflect Bernardin's vision for a world-class classified research library. In addition to accessing unique records from the Laboratory's history, NSRC researchers now see artifacts from the history of the Weapons Program, new research space, more powerful digital search tools, state-of-the-art digitizing equipment, and a greatly expanded staff of experienced archivists, librarians, digitizers, and historians. And now, plans have been approved to construct a second NSRC repository to store and digitize film media.

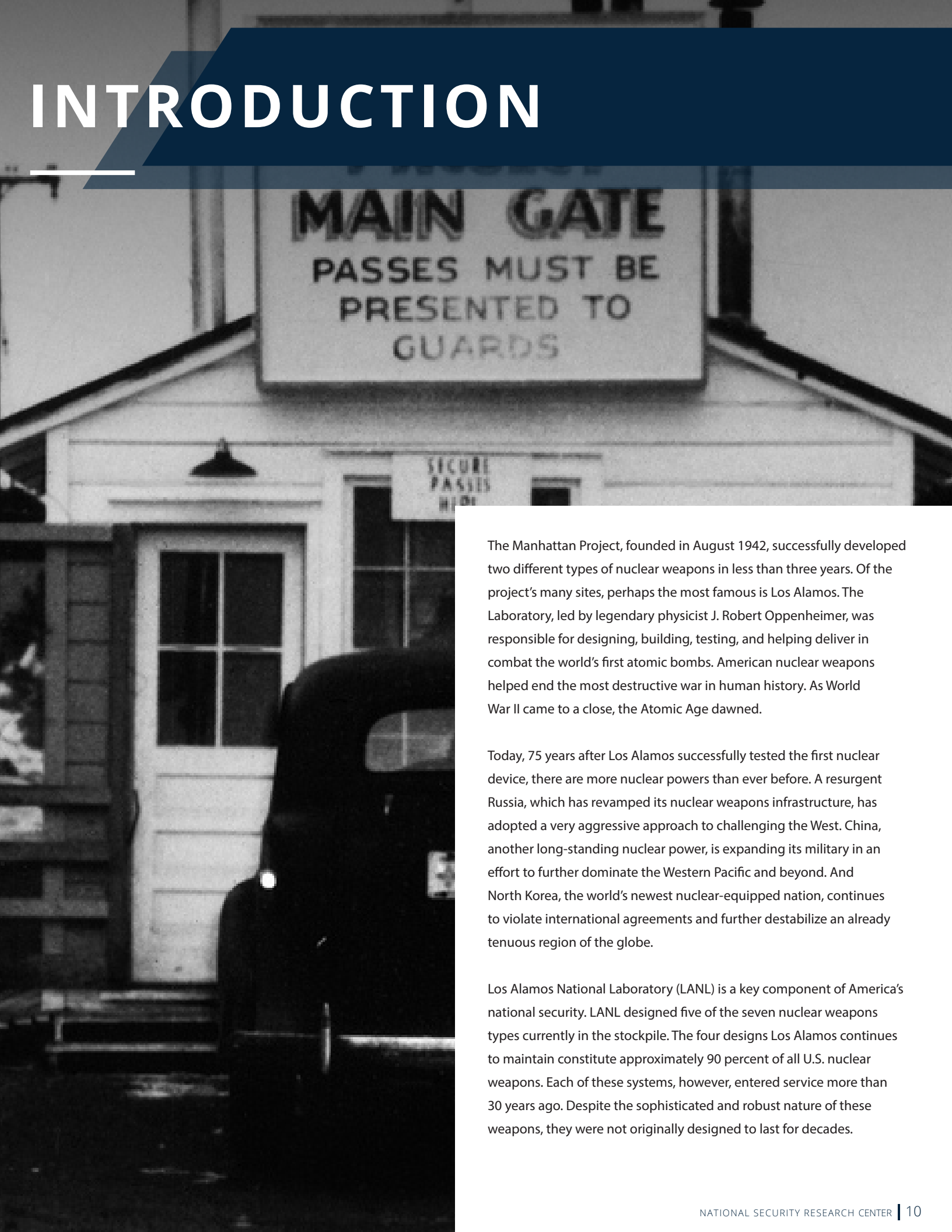
Though the NSRC is celebrating only one year of operation, the origins of this unique repository go back to the beginning of the Laboratory. The peril of World War II is now a distant memory, but the world remains dangerous.

"Given the current geopolitical environment, it's imperative that the technical staff at the Laboratory have access to the records and historical documents of our nuclear enterprise," says Charlie Nakhleh, Associate Lab Director, Weapons Physics. "A strong partnership between the NSRC and the Laboratory's researchers ensures that we fulfill our national security mission today for a safer tomorrow." 🗨️

"The NSRC is not just a historical archive, but a dynamic research library. Our collections are as relevant to the Lab's mission today as they were in the past."

Alan B. Carr, Senior Historian, National Security Research Center

INTRODUCTION



The Manhattan Project, founded in August 1942, successfully developed two different types of nuclear weapons in less than three years. Of the project's many sites, perhaps the most famous is Los Alamos. The Laboratory, led by legendary physicist J. Robert Oppenheimer, was responsible for designing, building, testing, and helping deliver in combat the world's first atomic bombs. American nuclear weapons helped end the most destructive war in human history. As World War II came to a close, the Atomic Age dawned.

Today, 75 years after Los Alamos successfully tested the first nuclear device, there are more nuclear powers than ever before. A resurgent Russia, which has revamped its nuclear weapons infrastructure, has adopted a very aggressive approach to challenging the West. China, another long-standing nuclear power, is expanding its military in an effort to further dominate the Western Pacific and beyond. And North Korea, the world's newest nuclear-equipped nation, continues to violate international agreements and further destabilize an already tenuous region of the globe.

Los Alamos National Laboratory (LANL) is a key component of America's national security. LANL designed five of the seven nuclear weapons types currently in the stockpile. The four designs Los Alamos continues to maintain constitute approximately 90 percent of all U.S. nuclear weapons. Each of these systems, however, entered service more than 30 years ago. Despite the sophisticated and robust nature of these weapons, they were not originally designed to last for decades.

SAMPLE OF NSRC HOLDINGS

Nuclear weapons designs

Assembly drawings

Nuclear test diagnostic data

Preshot reports

Postshot reports and analyses

Supporting and confirmatory experiments

Subcritical experiments

Stockpile stewardship experiments

Milestone reports

Classified research journals

U.S./U.K. collaboration documents

Internal memoranda

Working group notes

Histories

Code manuals

Test problems

The NSRC houses 75-plus years of nuclear weapons research, including designs, procedures, films, photos, and other reports. They are accessed daily by scientists, engineers, and researchers at the Lab and throughout the Nuclear Security Enterprise.

To extend the life of America's nuclear deterrent, which plays a critical role in maintaining stability in the global order, the Department of Energy (DOE) created the Stockpile Stewardship Program. Science-based stockpile stewardship is made possible by non-nuclear dynamic testing, advanced computer simulation capabilities, and decades of real-world data that have been collected and preserved by the staff of LANL's National Security Research Center (NSRC).

In 2019, the NSRC was stood up with the purpose of bringing the Laboratory's unique and invaluable information assets together and making them accessible to researchers throughout the Nuclear Security Enterprise (NSE). The archival collections housed in the NSRC are the result of decades of consolidation of mini-libraries and mini-archives at the Lab. As LANL's centralized classified library, the NSRC houses 75-plus years of nuclear weapons research, designs, procedures, films, photos, and other reports dating from the Manhattan Project to today. Its holdings are active collections used daily by scientists, engineers, and researchers at the Lab and throughout the NSE.

The collections maintained by the Center include test data and reports, which are used to enhance the simulations that assess and certify the stockpile. These simulations provide insight into the stockpile's aging materials and support life-extension initiatives, as well as allow for the consideration of new nuclear weapons systems. Additional collections include motion-picture films and photographs of nuclear tests. These provide information to refine detonation yield analysis, which assists weapons scientists and engineers in the development of new systems.

Scientists and engineers also use the NSRC's collections to consider alternative nuclear weapons technology not currently in the stockpile. Additionally, the archived reports and raw data can be used to refurbish the existing stockpile and support significant finding investigations.

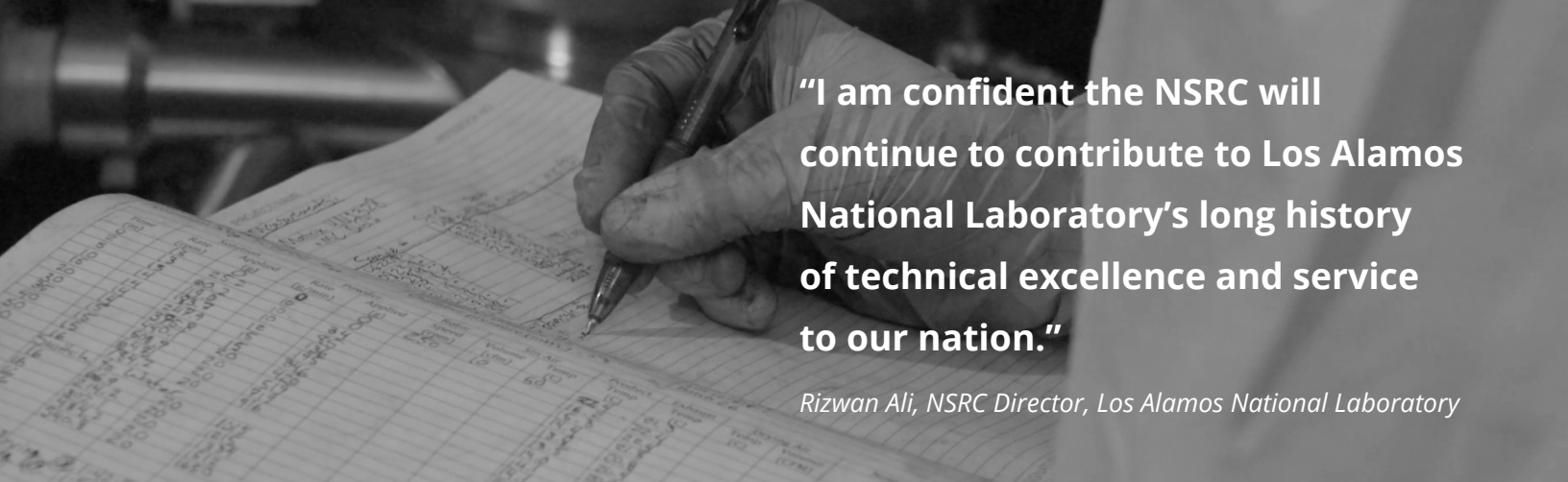
The Center's holdings include materials from other DOE labs and sites, such as the Rocky Flats Plant, Pantex Plant, Y-12 National Security Complex, Lawrence Livermore National Laboratory, and Sandia National Laboratories. Additionally, the Center has a large number of reports from the Department of Defense and the United Kingdom. Because of archive consolidations and space restrictions at the NSRC's partner organizations, the vast majority of the Center's holdings are not duplicated anywhere else in the NSE.

The Center's collections cover many classified scientific and engineering topics, including physics, engineering, chemistry, nuclear testing, material science, high-performance computing, stockpile stewardship, and nuclear propulsion. Its primary customers are in the LANL Weapons Program, but other customers are spread throughout the United States at other NNSA labs and sites and various organizations in the Department of Defense.

COLLECTION	CONTENT
Rocky Flats Collection	<ul style="list-style-type: none"> • Detailed pit production, certification, and use information • Technical reports describing efforts by researchers to develop new pit technology
Classified Reports Collection	<ul style="list-style-type: none"> • Studies of Soviet missile defense • Effects of underwater blasts on submarine integrity • Requirements for strategic stability • Development of warheads for advanced delivery systems • Special processes for pit welding
Top Secret Collection	<ul style="list-style-type: none"> • From the intelligence community, the Joint Chiefs of Staff, the Pentagon, and other government entities
United Kingdom Collection	<ul style="list-style-type: none"> • 7,000-plus accountable documents • Originally supported the 1958 Mutual Defense Agreement • Relevant in weaponry design, naval nuclear propulsion, and nuclear threat reduction
Wellnitz Collection	<ul style="list-style-type: none"> • Legacy weapons engineering drawings, nuclear test documentation, and hydrotest records • National Security Technologies (Nevada National Security Site) vault collection • Former J Division (field testing) collection • New materials from weapons physicists • Reaction history
Los Alamos Historical Collection	<ul style="list-style-type: none"> • Archival material related to the Manhattan Project • Correspondence, films, reports, engineering drawings, and lab notebooks

| *The Center's collections include physics, engineering, chemistry, nuclear testing, materials science, high-performance computing, stockpile stewardship, and nuclear propulsion. It is the world's most-comprehensive collection of nuclear weapons and national security materials.*





“I am confident the NSRC will continue to contribute to Los Alamos National Laboratory’s long history of technical excellence and service to our nation.”

Rizwan Ali, NSRC Director, Los Alamos National Laboratory

MEDIA TYPE	QUANTITY
Aperture cards	~880K
Audio cassettes	Hundreds
Books/logbooks/bound reports	~100K
CDs/DVDs/floppy disks/etc.	Thousands
Card catalog	~700K
Engineering drawings	Hundreds of thousands
Microfiche	~200K
Microfilm	~30K
Motion picture films	~20K
Paper	~40K boxes
Photos and negatives	~1M
Radiographs and x-ray films	~3.1 M
Videos	~10K
Online Vault	~400K
Uncataloged digitized documents	~2.4M

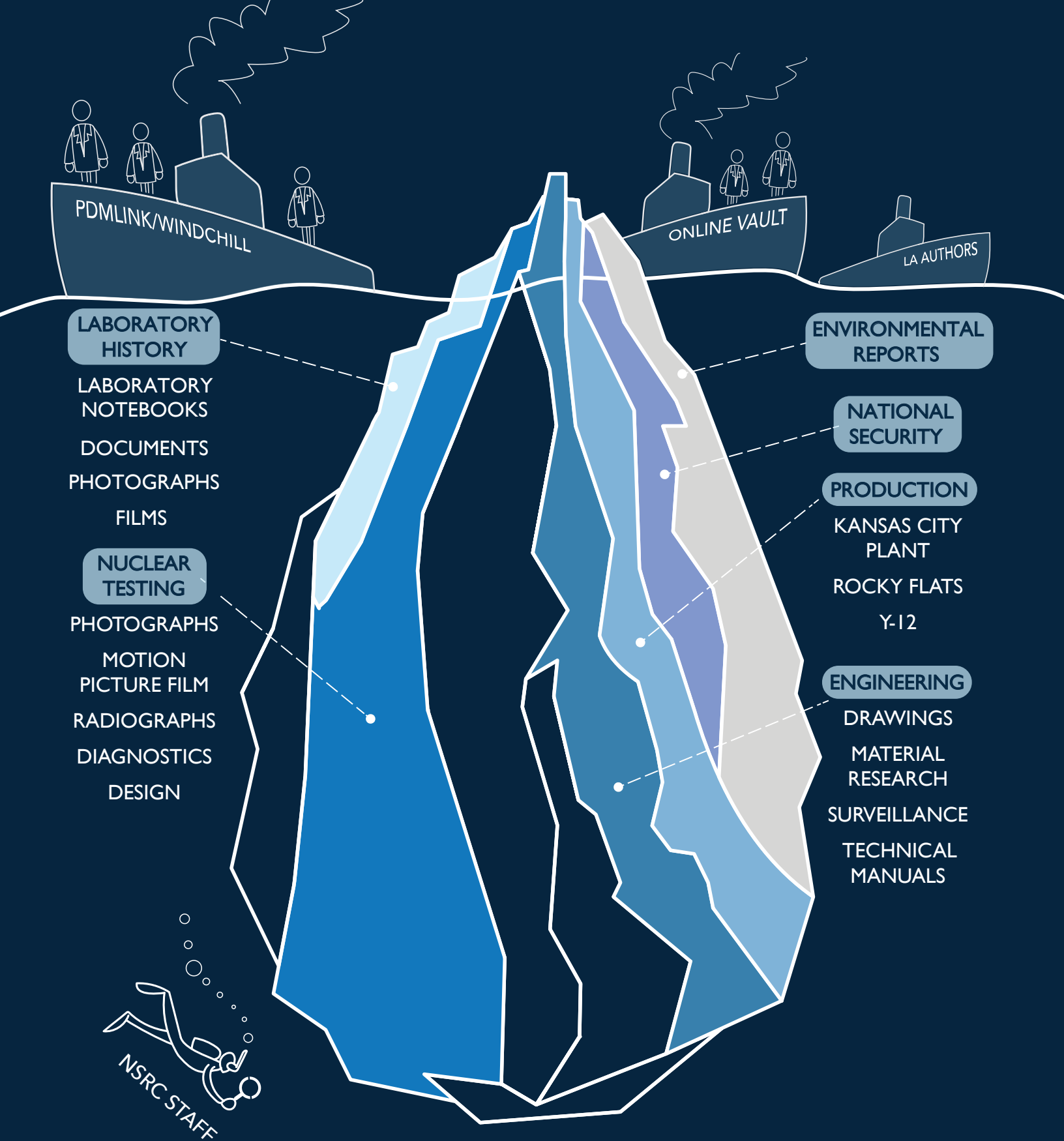
The NSRC’s collections include numerous media, ranging from audio cassettes to motion picture films to engineering drawings.

The NSRC’s holdings include a variety of media types, to include paper reports, engineering drawings, motion-picture films, microfiche, microfilm, photos, negative, radiographs, and videos. The holdings are housed in several large NARA-certified facilities and over a dozen smaller climate-controlled facilities. The Center’s collections also include millions of digitized records spread across multiple digital repositories. Only a small portion of these digital collections are directly accessible by customers, who must engage the NSRC staff of librarians and archivists to retrieve material from all of the NSRC’s physical collections and most of its digitized collections.

The Center’s expertise encompasses professionally trained librarians, archivists, historians, and digitizers. It is this depth of knowledge and capability that allows the NSRC to offer a broad range of services.

The NSRC’s strategic plan was developed to help guide the work of the Center. This plan is not intended to be an all-inclusive list of activities the NSRC needs to do to serve its customers and partners. It is intended to be a broad map to help determine the key long-term focus areas for the leadership of the NSRC. This strategic plan contains a set of goals that the NSRC should strive to meet over the next five years:

- 1 Strategic Goal:** A document collection and customer base that encompass both the entire Laboratory and selected external organizations.
- 2 Strategic Goal:** A comprehensive set of digitized collections that are cataloged and searchable using artificial intelligence/ machine-learning tools.
- 3 Strategic Goal:** Accelerated digitization labs with new processes that are established and operational.
- 4 Strategic Goal:** An expert staff with specialized skills enhanced through continued professional education and certification programs.
- 5 Strategic Goal:** A secure set of funding sources for enduring and enhanced operations and growth.



A highly trained staff of experts, including historians, archivists, and digitizers, partner with Lab researchers to help them navigate the tens of millions of materials housed in the NSRC.

STRATEGIC GOALS

STRATEGIC GOAL 1:

A document collection and customer base that encompass both the entire Laboratory and selected external organizations.

1.a. Enhance partnerships with the LANL Weapons Program and other LANL organizations.

Organizationally, the National Security Research Center (NSRC) resides within the Weapons Program at Los Alamos National Laboratory (LANL). Traditionally, a majority of the Center's customers have come from Weapons Physics. However, the collections within the NSRC have information that would benefit other efforts in the Weapons Program, such as Weapons Engineering and Weapons Production. The collections could also benefit a broader set of customers within Weapons Physics.

The NSRC should make contact to develop partnerships with managers at multiple levels of all three Associate Laboratory Directorates of the Weapons Program (Physics, Engineering, and Production) to understand how the NSRC's existing collections could benefit managers, program managers, and researchers. This partnership could include expanding the NSRC's physical and digital collections, while also allowing the Center's librarians access to these new collections for the benefit of researchers across the Weapons Program.

The Center should also explore partnerships with other organizations at the Lab, such as Global Security and the Research Library. The collections within the NSRC could benefit the work being conducted in Global Security, especially as it relates to nonproliferation. The unclassified LANL Research Library's processes and expertise could benefit the NSRC as it matures into a more robust research library for classified materials. This partnership between the unclassified and classified libraries has been strong since before the NSRC's inception in 2019, but the NSRC should continue to build on this partnership.

Additionally, the NSRC should continue to maintain a good partnership with the institutional records program. The records program will likely continue to be a conduit for new collections and help the NSRC meet records retention schedules.

The Center should strengthen partnerships with at least one Lab organization per year.



1.b. Strengthen partnerships with NNSA labs and sites.

Each National Nuclear Security Administration (NNSA) lab and site has its own archives. The NSRC has developed initial partnerships with each of these archival organizations, but these partnerships should be strengthened and formalized. This relationship should include agreements on how the NSRC shares its collections with other labs and sites and how those labs and sites share their materials with the NSRC.

The NSRC has a limited sharing agreement with Lawrence Livermore National Laboratory (LLNL). But this agreement is primarily for the sharing of information that has already been digitized. This partnership could be expanded to include sharing larger parts of each organization's collections, perhaps with the sharing of metadata and indices to the benefit of both.

Obtaining collections from current or closed labs and sites is another method of strengthening partnerships.

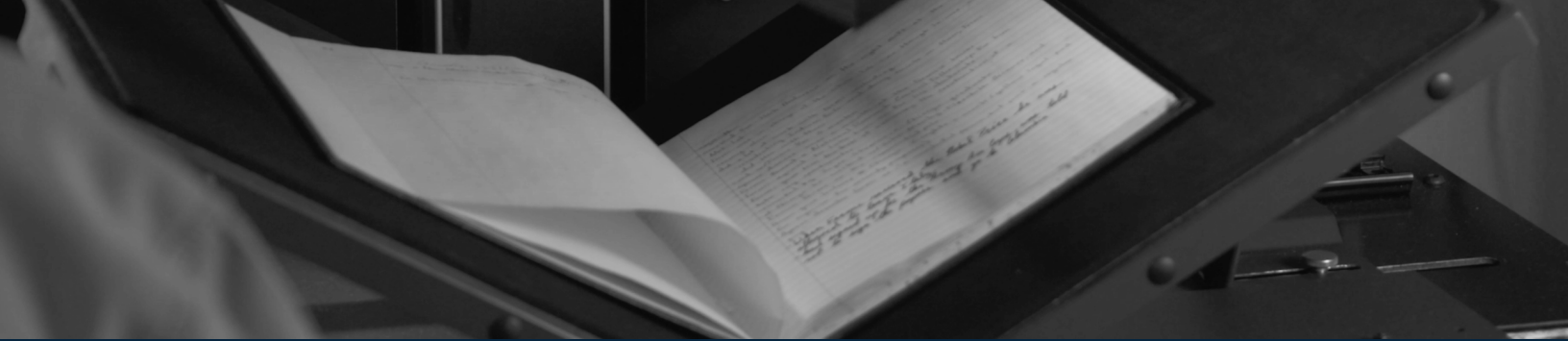
The Center should strengthen at least one partnership with NNSA labs and sites per year.

1.c. Develop partnerships with Department of Defense organizations and other organizations.

The partnership between LANL and the Department of Defense (DoD) has been strong since the Lab's inception under the Manhattan Project. However, the sharing of information between the two organizations is not a codified process, and each request is handled on a case-by-case basis. The NSRC should attempt to build information sharing partnerships with various DoD organizations, such as the Defense Threat Reduction Agency, U.S. Strategic Command, and the Air Force Technical Applications Center. Because these organizations are outside of the NNSA's purview, it is likely that additional levels of approval may be required both at the Lab and at the partner agencies.

There are other organizations with which the NSRC has both formal and informal partnerships, to include the United Kingdom's Atomic Weapons Establishment. The NSRC should explore whether information sharing partnerships could be expanded or further formalized.

The Center should develop partnerships with at least two DoD or other organizations over the next five years.



STRATEGIC GOAL 2:

A comprehensive set of digitized collections that are cataloged and searchable using artificial intelligence/machine-learning tools.

2.a. Implement an artificial intelligence/ machine-learning system to perform automated cataloging on digitized files.

The digitized collections that the Center's staff have access to are vast, with millions of individual data files in a number of formats. A very small percentage of these files, estimated at less than 10 percent, have been adequately cataloged to allow them to be searched using an automated system. The remaining digitized files have rudimentary or nonexistent cataloging and indexing information.

The NSRC is currently using manual methods to catalog each digitized file. This is a time-consuming process that takes 10 to 30 minutes per document. Using the manual cataloging method, the NSRC estimated it will take over 400 years to catalog just one portion of the digitized collection. The digital collections are growing rapidly, so the true time to catalog the Center's collections would likely be in the thousands of years if current processes continue.

An automated cataloging system based on artificial intelligence/ machine-learning technology is the only way to catalog the vast, rapidly growing digital collections in a reasonable amount of time. The Center's staff have found a small set of companies that specialize in this type of machine-learning technology, which is currently being used in the U.S. intelligence community.

The Center should aim to have an artificial intelligence/machine-learning system in place on the classified network to catalog its digitized collections in the next five years.

2.b. Implement a tool to allow researchers to search through various digital collections.

The NSRC's digital collections are spread across a variety of platforms including the Documentum-based Online Vault, SharePoint, and shared drives. Searching through these digital repositories is a cumbersome process for the Center's staff. For customers, the process is inaccessible because they do not have permission to access many of the NSRC's internal digital resources. Even if permission were granted, the material is not organized for navigation by the Center's customers.

An advanced search system is required to allow researchers to find relevant information across all the varied digital stores. This system would enforce applicable security and need-to-know protocols. The NSRC should make the acquisition and implementation of this system a top priority, along with the machine-learning-based automated cataloging system.

The Center should aim to have an artificial intelligence/machine-learning system in place on the classified network to search through its digital collections in the next five years.

2.c. Explore extending cataloging and search tools to archives of partner labs and sites.

One of the big challenges faced by the NNSA's labs and sites is that individual locations do not know what information is available at the other labs and sites. This causes a duplication of work, which might be avoided if all the NNSA-wide information was discoverable to all researchers.

Once artificial intelligence/machine-learning cataloging and search functions are established across the NSRC's collections, the Center should collaborate with the NNSA and the other labs and sites to see if this system could be expanded to include the digitized archival collections outside of the Lab. This integrated, NNSA-wide system would allow researchers across the NNSA to find relevant information for their work.

Existing security, intellectual-property, and need-to-know protocols would need to be enforced, with some users (librarians, archivists, historians) having elevated privileges to allow them to assist customers.

The Center should enter into discussions with at least one NNSA lab over the next five years to see if there is a way to extend its artificial intelligence/machine learning to the partner lab.



STRATEGIC GOAL 3:

Accelerated digitization labs with new processes that are established and operational.

3.a. Obtain production-scale equipment and develop processes to accelerate digitization of physical collections.

Most commercially available digitizing equipment is manufactured for home or small-office use. Though the equipment may be inexpensive and readily available, it generally does not provide the speed, quality, or reliability needed for the volume of the NSRC physical collections. Before purchasing, the NSRC should evaluate digitizing equipment to ensure that it has been manufactured for high-volume, high-speed applications and that it can operate on the Lab's classified network.

The Center should evaluate its set of digitizing equipment each year to see if more efficient equipment is available to implement in its production-scale digitizing operations.

3.b. Implement NARA digitization standards.

The National Archives and Records Administration (NARA) has an extensive set of digitizing standards for various media types. These standards cover not only the raw, lossless files but also the easier-to-access lossy formats. The NSRC should follow both these standards as closely as possible. Additionally, the specific digitizing standards implemented by the NSRC should be documented in an easy-to-read guide that can be shared with customers as well as the other labs and sites.

The Center should evaluate NARA standards every year to ensure the NSRC's digitizing procedures follow NARA recommendations as closely as possible.

3.c. Improve quality control, indexing, and storage processes.

The NSRC should implement quality-control processes that ensure digitized material meets the required digitizing standards and reflects an accurate copy of the original material. This quality-control process should be conducted by an independent trained staff member, one who is not the creator of the digitized content.

Additionally, the NSRC should create a standardized index of the digitized material that would allow the collection to be searched. The digitizer could execute this indexing operation, or it could be done during the quality-control process.

Finally, the Center should ensure all its digitized content is stored in a location where automated backups are done on a frequent basis. All the digitized content should also be backed up to one or more off-site locations. Additionally, each of these backups should be tested regularly to ensure the files are accessible.

The Center should evaluate its quality control, indexing, and storage processes each year to ensure they are optimal.

STRATEGIC GOAL 4:

An expert staff with specialized skills enhanced through continued professional education and certification programs.

4.a. Grow the skill level of staff in the execution of their primary duties.

The skill level of the NSRC's staff in their primary duties (librarian, archivist, digitizer, historian) can be increased through both in-house and outsourced training classes. This training can be for new equipment or be more generalized training, such as digital archiving processes or customer support training, to broaden the staff's professional knowledge.

The Center should budget for resources that will increase staff's skill levels and evaluate annually the effectiveness of these resources.

4.b. Implement an annual certification program for staff using specialized digitizing equipment.

The NSRC uses highly specialized digitizing equipment that is far beyond the limited capabilities of equipment for home or small-office use. This equipment is complicated to operate, with dozens of user-configurable parameters and sophisticated processing software.

The Center should develop an annual certification program for each piece of digitizing equipment to ensure that staff know how to use it properly and are familiar with the digitizing standards for the particular media type associated with the digitizing equipment.

4.c. Broaden the knowledge of staff through a continuing professional education program.

The NSRC's senior leadership contacted or visited a number of major research libraries and archives, including the National Archives and Records Administration, the George H. W. Bush Presidential Library, Purdue University, Massachusetts Institute of Technology, the United States Air Force Academy, the Naval Postgraduate School, and the RAND Corporation. One of the purposes of the contact was to determine the type of continuing professional education (CPE) programs these institutions had implemented.

Most institutions require their staff to earn a minimum of 24 CPE credits per year with one, the RAND Corporation, requiring 40 CPE credits per year. The NSRC has implemented a requirement for all its staff to earn a minimum of 24 CPE credits per year. These credits can be earned across a broad range of categories.

A part of the staff's CPE credits each year should be dedicated to increasing their overall general knowledge of nuclear weapons' science and history, for example, by attending TITANS and WESH classes or lectures offered by the NSRC and Weapons Working Group. This general knowledge will help the staff gain a better understanding of the value of the NSRC's collections as well as better meet customer needs.

The Center should establish a CPE program for its staff and implement a tracking mechanism for earned CPEs so its staff and management can monitor progress. The CPE program should be reevaluated annually to ensure it meets the needs of the NSRC and the staff.





STRATEGIC GOAL 5:

A secure set of funding sources for enduring and enhanced operations and growth.

5.a. Ensure staff, maintenance contracts, equipment upgrades, and ongoing initiatives are fully funded.

There is a certain amount of baseline funding required to keep NSRC operational. This funding includes money for core as well as deployed staff, equipment maintenance contracts, equipment upgrades, and ongoing initiatives (Classified Reports Collection indexing, production of LANL-LLNL nuclear weapons testing book, etc.) to support the Center's customers. Without this baseline funding, the NSRC will not be able to fully function as a research support institution. An enduring source of funding for these critical areas should be the NSRC's top priority.

The Center should work with the Lab's senior management and the NNSA each year to ensure adequate funding exists for staff and operations.

5.b. Secure funding for a permanent facility to house film media, additional storage for new collections, and any necessary future expansions of digitization operations.

A large portion of the NSRC's collections was displaced to make room for a higher-priority mission at LANL. These collections encompassed all the NSRC's film and video media, including motion-picture films, microfiche, microfilm, photo negatives, and radiographs. The material was relocated temporarily to a large number of small climate-controlled facilities.

The Center should advocate for the construction of a dedicated film and video media building in the next five years that meets NARA archiving requirements. This facility should have sufficient space to establish accelerated, production-scale digitization laboratories for the media it houses.

5.c. Work with the Lab's senior management and the federal program manager to secure long-term and permanent funding sources.

The NSRC is currently funded through processes that require the Center to justify its funding each year. This justification process involves the development of work packages that cover multiple charge codes. There is considerable risk and instability operating a major institutional center in this manner. The NSRC should work closely with the Lab's senior management and budget analysts to identify a path to secure long-term, permanent funding for the NSRC.

Though created and sponsored by LANL, the NSRC is an NNSA weapons complex asset and should be funded as a complex-wide asset with long-term, permanent funding.

The Center should work annually with its federal program manager to explore ways to obtain long-term, permanent funding through one or more enduring funding sources at the NNSA. This would help the Center establish NNSA services, such as research librarian support, accelerated digitization services, and machine-learning-based cataloging and search capabilities. ☺

CONCLUSION

The National Security Research Center is a truly remarkable, one-of-a-kind organization with a vital purpose.

Today's geopolitical environment underscores the Lab's nearly 80-year national security mission and the NSRC's critical role in that mission. The collections in the NSRC serve as the foundation for LANL's future innovations in the stewardship and development of nuclear weapons.

The maintenance and growth of the NSRC necessitate strategy and foresight. Furthermore, in order to assure LANL's mission success, the NSRC seeks purposeful and meaningful development during the next five years. This includes further refining its processes, enhancing its program management, and growing its partnerships and collections. As outlined in this strategic plan, the NSRC is prioritizing the following goals:

- A document collection and customer base that encompass both the entire Laboratory and selected external organizations.
- A comprehensive set of digitized collections that are cataloged and searchable using artificial intelligence/machine-learning tools.
- Accelerated digitization labs with new processes that are established and operational.
- An expert staff with specialized skills enhanced through continued professional education and certification programs.
- A secure set of funding sources for enduring and enhanced operations and growth.

The Lab relies on the NSRC's success. The NSRC ensures the Lab – and the nation – remain vigilant and ready. 🔗



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The National Security Research Center (NSRC) is the Lab's classified library and houses a large number of nuclear weapons collections as well as the Lab's historical holdings. These include classified research in physics, engineering, chemistry, metallurgy, and other areas as they relate to nuclear weapons. The NSRC supports classified repositories such as the OnlineVault and PDMLink, and provides document digitizing services.

THE NSRC OFFERS

- Research librarian support
- Archiving
- Digitizing
- Historian support
- Digital repository searches
- Physical collections searches
- Collaboration space

2021
THROUGH
2023

ESTABLISH ACCELERATED DIGITIZATION LABS AND PROCESSES.

- Digitizing holdings requires the correct equipment, new processes to facilitate the greater speed and volume, new staff training, and additional facility space.

2021
THROUGH
2026

SECURE ENDURING FUNDING FOR OPERATIONS AND EXPANSION.

- Enduring funding will ensure a proper level of staffing, enhancement of accelerated digitization capabilities, and the implementation of a cataloging and search system based on artificial intelligence and machine learning.
- Additional funding will pay for one or more permanent storage facilities and digitization facility space.

2021
THROUGH
2026

IMPLEMENT AUTOMATED CATALOGING AND SEARCH TOOLS.

- Less than 10 percent of the physical collections have been digitized and less than 10 percent of those digitized collections have been cataloged.
- A natural-language cataloging and search system based on artificial intelligence and machine learning will allow digitized collections to be searched while maintaining security and need-to-know protocols.

2021
(ONGOING)

INCREASE STAFF'S SKILL LEVELS, CONTINUING EDUCATION, AND PROFESSIONAL CERTIFICATION.

- Staff development will be achieved through professional training classes, industry conferences, and internal opportunities focused on areas of expertise.
- An equipment certification program will be developed to ensure staff are trained and adhering to standards for each of the NSRC's media types.
- Staff will increase their knowledge of nuclear weapons science and history to better meet customer needs.

2021
(ONGOING)

DEVELOP AND ENHANCE PARTNERSHIPS WITH INTERNAL AND EXTERNAL ORGANIZATIONS.

- The collections are beneficial to others in the Weapons Program and elsewhere in the Lab.
- New partnerships will be developed with other NNSA labs and sites, as well as DoD organizations, while strengthening existing external partnerships.

